Paper No. 39

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte KOUYA KAWABATA
AND MITSURU SAWANO

_____

Appeal No. 2003-1251
Application 09/226,128

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HEARD: NOVEMBER 5, 2003

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Before THOMAS, RUGGIERO and LEVY, Administrative Patent Judges.

THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's final rejection of claims 1-4, 6-8, 10-13 and 15-20.

Representative claim 1 is reproduced below:

1. An image forming method, comprising steps of:

providing an image receiving member, and a transfer member including a transfer material formed thereon;

forming a latent image on one of the transfer material and the image receiving member in liquid containing a thermosetting adhesive material;

bringing the transfer member and the image receiving member into close contact with each other so that the latent image is sandwiched between the transfer material and the image receiving member;

applying heat to cure the adhesive material so that the transfer material is fixed to the image receiving member through the cured adhesive material; and

after curing, separating the transfer member and the image receiving member from each other such that the latent image is fixed only to the image receiving member.

The following references are relied on by the examiner:

Hindman et al. (Hindman)	5,614,933	Mar. 25, 1997
Cloutier (EPA)	0 414 362	Feb. 27, 1991
Diggle (U.K. Patent)	2 259 888	Mar. 31, 1993

Claims 1, 3, 4 and 6-8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Diggle. Also rejected under this statutory provision are claims 1-4 and 6-8 as being anticipated by Cloutier. Finally, claims 1-4, 6-8, 10-13 and 15-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hindman.

Rather than repeat the positions of the appellants and the examiner, reference is made to the briefs and answer for the respective details thereof.

OPINION

As a result of our study of the disclosed and claimed invention, the teachings of the applied prior art and the positions of the appellants and the examiner, we sustain only the rejection of claims 1-4 and 6-8 as being anticipated by Cloutier under 35 U.S.C. § 102(b).

Generally, for the reasons set forth by the appellants in the brief and reply brief, we reverse the rejection of claims 1, 3, 4 and 6-8 as being anticipated by Diggle. Both independent claims 1 and 4 within this rejection recite the formation of a latent image on the claimed material or member by means of a liquid containing a "thermosetting adhesive material." These claims also recite the application of heat to cure this adhesive material so that the claimed transfer material is fixed to the image receiving member through the use of the cured adhesive material.

Our study of Diggle leads us to agree with appellants' observations at pages 4 and 5 of the principal brief and those set forth at pages 1-3 of the reply brief. There is no dispute that the adhesive material in this reference is a thermoplastic adhesive. For such materials, the application of heat does not accomplish the claimed "curing" such that the transfer material

is fixed to the image receiving member as claimed. We agree with appellants' views that Diggle's thermoplastic material would simply melt upon the application of heat and not "cure" the adhesive material as claimed.

Most telling, however, are the positions set forth in the reply brief including the definition of thermoplastic materials from the Condensed Chemical Dictionary. They are defined as a "high polymer that softens when exposed to heat and returns to its original condition when cooled to room temperature." Besides not reciting a thermosetting material as required by independent claims 1 and 4 on appeal, the properties associated with a thermoplastic according to the definition do not provide the claimed curing such that a transfer material is fixed to a image receiving member as also required by these claims on appeal.

As such, we must reverse the rejection of independent claims 1 and 4 on appeal as well as their respectively rejected dependent claims according to the examiner's first stated rejection.

Next, we also reverse the rejection of claims 1-4, 6-8, 10-13 and 15-20 as being anticipated by Hindman.

Whereas independent claims 1 and 4 on appeal require a thermosetting adhesive, we agree with appellants'

characterization beginning at page 10 of the principal brief on appeal that Hindman's adhesive material appears to be thermoplastic in nature. As such, it is incapable of being cured to the extent recited in the claims on appeal as discussed earlier as to Diggle.

The nature of the ink itself in Hindman is characterized as a phase change ink. As set forth at the following locations in this reference, this ink is heated and subsequently cooled twice: the abstract, the prior art discussion at column 2, lines 1-27; the Summary of the Invention at column 3, lines 24-46; and the discussion at column 5, line 33 through column 6, line 4. The details of this prior art ink used in Hindman are set forth at column 6, line 64 through column 8, line 57. Significantly, the figure 4 showing indicates that this ink is characterized also as a hot melt ink. According to the just-noted functional use of Hindman's prior art phase change ink as well as its characterization in Figure 4 of this reference as a hot melt ink, it is therefore considered to be a thermoplastic-based material in accordance with the definition from the Condensed Chemical Dictionary attached to the reply brief. Thus, as to independent claims 1 and 4 on appeal the artisan would not consider such an adhesive material in the ink of Hindman as a thermosetting

adhesive as required by these claims on appeal. In a manner similar to our analysis with respect to Diggle, the additional requirement of these claims that heat "cures" the adhesive material such that the transfer material is fixed to an image receiving member would also not be met as argued by appellants in the brief and reply brief.

We turn now to the subject matter of independent claims 10 and 13 on appeal, both of which require a formation of a latent image by means of a liquid containing an "ultraviolet curing adhesive material." These claims also require that the curing function is by means of ultraviolet rays.

The only portion of Hindman argued by the examiner and apparent to us from our study of it that relates to such ultraviolet curing is the alternative embodiment discussed at column 15, lines 6-23. However, as correctly pointed by appellants at pages 6 and 7 of the reply brief, this teaching exclusively relates to the materials of a liquid layer in a direct image process in which the ink and intermediate liquid layer is placed directly upon the image receiving member, and does not relate to the ink itself. In contrast, the initial showings in Hindman's figures are with respect to a transfer printing process. Since it is the liquid layer that is taught

at the column 15 portion of Hindman that contains the adhesive material that is taught to be cured by heating or ultraviolet energy and not the phase change ink itself, the reference does not teach the feature of forming the latent image by means of a liquid containing an ultraviolet curing adhesive material as required by independent claims 10 and 13 on appeal.

Since we have not sustained the rejection of independent claims 1, 4, 10 and 13 under 35 U.S.C. 102 as being anticipated by Hindman, we also must reverse the rejection of their respective dependent claims.

Finally, we sustain the rejection of claims 1-4 and 6-8 as being anticipated by Cloutier. We note again that the subject matter of independent claims 1 and 4 on appeal requires a thermosetting adhesive material rather than a thermoplastic adhesive material. In sustaining the rejection, we disagree with appellants' views in the brief and reply brief that Cloutier essentially teaches a thermoplastic adhesive material.

The ink droplets 10 in Figure 2 include an adhesive material with other additives. Two prior art materials are discussed at pages 3 and 4 of this reference. Both the "Loctite 408" and the "Bostik Super Bond" material both appear to be prior art

cyanoacrylate-based adhesives. Both are shown according to the tables presented at the top of page 4 of this reference to include the use of water as a solvent.

The discussion at the bottom of page 7 of the principal brief on appeal appears to admit that the Loctite 408 material is a form of heat-curable adhesive since it is admitted that it is cured by heating. The polymerization process admitted here at this portion of the brief indicates a permanent chemical change such as to fairly characterize the Loctite 408 material as a thermosetting adhesive in accordance with the Condensed Chemical Dictionary definition attached to the reply brief.

When the Loctite 408 technical data sheet associated with the reply brief is reviewed, we reach a similar conclusion. As argued at the bottom of page 3 of the reply brief, this data sheet does indicate that the Loctite 408 material is cured by surface moisture. The data sheet does not indicate that it is not cured by heating. Under the topic TYPICAL CURING PERFORMANCE at column 1 of page 1 of this technical data sheet, it is stated that "the surface moisture initiates the hardening process." It appears that the data sheet intends the use of the word hardening here to indicate curing since the paragraph continues by indicating in turn that "curing" continues for at least 24 hours.

Although the remaining portions of the two pages of this technical data sheet are silent as to the relationship of temperature and curing, it appears that room temperature is all that is necessary for the curing process to be effected in 24 hours. It is noted as well that the cured material has different, distinct properties than the uncured material.

Of particular note is the statement from the definition of thermosetting materials taken from the Condensed Chemical Dictionary attached to the end of the reply brief. It is indicated that alkyds are usually considered to be thermosetting in nature. Consistent with this, the uncured material properties of the Loctite 408 data sheet indicates that the chemical type of this material is alkoxy-ethyl cyanoacrylate as noted at the top of column 1 of page 1 of this data sheet. It appears then that the artisan would consider Loctite 408 material as a form of alkyd which is considered to be a thermosetting material.

These observations of ours with respect to the Loctite 408 data sheet are confirmed by Hawley's Condensed Chemical Dictionary, Eighth Edition, page 250 (1971). This dictionary defines cyanoacrylate adhesives at page 250 as being alkyl-based adhesives having excellent polymerization and bonding properties, and that they are used in printing environments. This is

consistent with appellants' definition of thermosetting attached from the Condensed Chemical Dictionary as a part of the reply brief as it relates to cross-linking the reactions of polymers and the fact that alkyds are usually considered to be thermosetting. We also confirm our observations from Harper's Handbook of Plastics, Elastomers and Composites, Second Edition, page 9.78 (1992). Table 9.32 on page 9.78 indicates that cyanoacrylates are thermosetting adhesives which are curable at room temperature. These pages of the noted dictionary and handbook are cited by us to further substantiate facts already in the evidentiary record made by the examiner and appellants. As such, they are not considered a basis for a new ground of rejection but are considered standard reference works in the art. See In re Boon, 439 F.2d 724, 727, 169 USPQ 231, 234 (CCPA 1971).

Notwithstanding these considerations, the teachings in the paragraph at the bottom of column 4 outlined by the examiner in Cloutier (see lines 44-54) indicates that after the image pattern 20 has been placed upon the substrate material in Figure 2 of Cloutier, the resulting combination is run through pinch roller assembly 43 that is heated by infrared heat lamp 41. "The temperature and pressure levels described above enable the adhesive in the ink to securing engage and affix the portions

42 of the metal layer 40 to the substrate 12. The unaffixed portions 44 of the metal layer 40 surrounding the portions 42 shown in Figure 3 remain detached from the substrate 12." Not only does this portion of Cloutier indicate that the Loctite 408 material is a thermosetting material since it is cured by heating, it also functions in such a manner as to be cured so that the transfer material is fixed to the image receiving member as required by independent claims 1 and 4 on appeal. Therefore, appellants' remarks traversing the rejection in the brief and reply brief are not well-founded.

In view of the foregoing, we have sustained the rejection of claims 1-4 and 6-8 as being anticipated by Cloutier. We have also reversed the corresponding rejections under 35 U.S.C. § 102 of claims 1, 3, 4 and 6-8 as being anticipated by Diggle and the separately stated rejection of claims 1-4, 6-8, 10-13 and 15-20 as being anticipated by Hindman. Therefore, the decision of the examiner rejecting the claims on appeal under 35 U.S.C. § 102 is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

James D. Thomas Administrative Patent Judge	)	
Joseph F. Ruggiero Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
Stuart S. Levy Administrative Patent Judge	)	

JDT/cam

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